UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VIII
999 18th STREET - SUITE 500
DENVER, COLORADO 80202-2466

APPLICATION FOR USE

OF

BIOREMEDIATION TECHNOLOGY

AT

NAPLES TRUCK STOP

OPA REMOVAL ACTION

NAPLES, UTAH

U.S. EPA Region VIII
Emergency Response Branch
Denver, Colorado

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On-Scene Coordinator

BIOREMEDIATION USE AUTHORIZATION FORM

A. DETAILS OF SPILL

1. SPILL DATA

a. Circumstances

The incident occurred at an active facility. The facility is a Service Station, Truck Stop, and Bulk Petroleum Distributor. A buried supply pipeline leading from the unleaded gasoline above ground storage tank to the service pump apparently had been leaking for an undetermined amount of time. It is estimated that more than 7000 gallons of unleaded gasoline had leaked into the shallow (varies from 3 to 12 feet) groundwater of the alluvial aquifer. There is a free product (gasoline) plume on shallow groundwater over an area approximately 600 feet by 400 feet. Gasoline fumes had entered buildings. A PVC drinking water line and a sewer line was threatened.

b. Location of Spill

The Naples Truck Stop is an independently owned Texaco station located at 1625 South 1500 East, State Highway 40, Naples, Utah. Petroleum product is stored in several above ground storage tanks. Naples is a small industrial/residential area on the southeast edge of Vernal. The site covers approximately 30 acres which includes neighboring properties. An unnamed creek is adjacent to the site. The gasoline plume on groundwater threatens navigable waters of the United States via the adjacent flowing unnamed creek. Most of the groundwater plume underlies a neighboring property owned by Questar Corporation a petroleum and natural gas pipeline company. It was Questar who discovered the spill when the alarm sounded on their underground tank leak detection system. Questar's underground tank was not leaking. Their investigation indicated the truck stop was the source of the spilled gasoline.

Distance and Direction from Navigable Water:

The unnamed creek is approximately 200 feet south and down (hydraulic) gradient of the leading edge of the plume. The unnamed creek is a tributary of Ashley Creek which is tributary to the Green River.

Latitude and Longitude:

Latitude : 40° 25' 54"
Longitude: 109° 29' 50"

Habitats affected:

There are no known affected habitats, all of the contamination is below ground surface. Approximately 600 people live or work within a one-mile radius of the site.

Description of Topography:

The topography is very flat. Almost the entire plume is under pavement. Over half of the plume is under the Questar property which is completely covered by pavement. Most of the other half of the plume is covered by Naples Truck Stop pavement.

Soil Type:

Vernal and Naples are situated in a broad alluvial plain created by Ashley Creek. The contaminant plume is in a shallow alluvial aquifer in the alluvial plain. The composition of the aquifer varies from cobbles to clay in a wide range of combinations. The bedrock is a weathered shale formation which is relatively impermeable. On top of the shale is a fairly distinctive layer of sand, gravels and cobbles. The remaining upper section of the alluvial material is composed of lenses of clay, sandy clays, clay sands, and gravels. As expected the hydraulic conductivity of the aquifer varies considerably laterally and vertically.

c. **Time and Date of Spill**

The spill was discovered November 1, 1993 by Questar Pipeline Corporation.

d. **Potentially Responsible Party**

When the release was first detected Questar suspected their underground storage tank was leaking and began an investigation. After drilling wells and conducting a soil gas survey Questar traced the plume to the truck stop. The plume is approximately 600 feet in length on the elongated axis and 400 feet wide. Up to 18" of free product has been observed in one well. On February 13, 1994 the owner of the truck stop had the suspected tank and supply lines pressure tested. One supply line failed to hold any pressure. Samples of the gasoline from the tank, product from the wells, and product from other tanks in the area were analyzed by a local lab under the direction of the County Environmental Health Director. The best match with the gasoline from the wells (leaked product) was the gasoline from the truck stop tank. The U.S. Coast Guard sent the Truck Stop owner a letter of designation. The owner refused to accept designation. The cleanup has proceeded using OPA Fund money.

Name of Company:

Crofts Oil Co., Naples Truck Stop (an independently owned Texaco station).

Address:

1625 South 1500 East, State Highway 40, Naples, Utah, 84078. P.O. Box 401.

Individual to Contact:

DeLin J. Crofts

Telephone:

801-789-3355 or 801-789-7600.

e. **Product Spilled**

Type of Product:

Refined product.

Name of Crude or Product:

Unleaded gasoline.

Volume Released:

Estimated at 7,000+ gallons.

f. **Type of Release**

The release was intermittent. The buried line would only leak when pressurized for fueling a vehicle. To fuel a vehicle at the service island gas was pumped from the above ground tank through the leaking supply line to the dispenser/register. This supply line and tank has been taken out of service.

2. **PROPERTIES OF THE SPILLED OIL**

a. **Specific gravity** - 0.65

b. **Viscosity** - 0.65 cST at 40° C

c. **Pour point** - Unknown

d. **Sulfur content** - Unknown

3. **IS OIL EXPECTED TO BE AMENABLE TO BIOREMEDIATION?**

X Easily

o Moderately

o With difficulty

How was this estimate made (e.g., from known oil-properties, from constituent characteristics, from field trials, from laboratory tests, from historical use information)?

The best estimate was made from field trials on the site. There was an interim trial run and two field trials. The first field trial was conducted by the vendor, Richards Laboratories of 55 East Center, Pleasant Grove, Utah, 84062 at Questar's request. Questar had used their underground storage tank to store contaminated water and free product pumped from the aquifer during their initial investigations. The contents of the tank were inoculated with the organisms and nutrients added. At the end of one month the contents were sampled and analyzed. The organisms had completely cleaned the water of free product and dissolved phase. A summary of the test is attached entitled a "Summary

of Questar's UST Pilot".
Then there was an interim period, before EPA assumed control of the response, during which Questar operated their pump-and-treat system and utilized the bio-reactor water treatment system set up for them by Richards. EPA monitored the effectiveness of the water treatment system during this use. EPA found that it worked effectively to clean the water to the EPA Maximum Contaminant Level (MCLs) standards required by the Publically Owned Treatment Works (POTW) before release to their treatment system.
The second and formal field trial was conducted by the USACE and their contractor, IT, at the EPA FOSC's request. This trial utilized the water treatment system that was constructed by Richards for Questar and acquired by EPA when EPA assumed control of the Removal Action. A complete description, explanation and the evaluation of the field trials (termed the interim bio treatment system) is presented in the attached Bioremediation Treatment Plan. Richards Laboratories has also successfully used this technology on at least two other sites in Utah involving gasoline spills at Leaking Underground Storage Tanks (LUST).

B. **SPILL AND WEATHER - TO BE PROVIDED AT TIME OF SPILL BY SPILLER (IF KNOWN), HIS AGENT, OR BY THE FOSC. ATTACH ADDITIONAL SHEETS IF NECESSARY.**

1. **Weather conditions and forecast:** NA

   a. **Air Temperature: Day** NA **Night** NA

   b. **Other** NA

   This site is a long term remediation effort and is expected to take five or more years. Weather conditions will vary considerably over this length of time. The temperatures that will be experienced at the site will vary from an extreme high of 105° F to an extreme low of -20° F. The general climate of the area is arid. The hydrology of the site is relatively unaffected by individual precipitation events. The hydrology is controlled more by seasonal events. The Two most important are Spring runoff and irrigation during growing season.

C. **DETAILS OF BIOREMEDIATION PLAN - TO BE PROVIDED AT TIME OF SPILL BY SPILLER (IF KNOWN), HIS AGENT, OR THE SSC**

A complete description and explanation of the bioremediation plan is attached to this application entitled the Bioremediation Treatment Plan Naples Truck Stop. Also in the plan is the evaluation of the final field trial (this trial was run as and called the interim bio treatment system). Note that the interim bio-treatment system was run in conjunction with and upstream of proven technology, air stripping and carbon adsorption, prior to release to the local POTW (water treatment plant). This ensured that required treatment standards were met prior to release to the POTW.

1. **Specific Location Proposed for Treatment:**

Water treatment will be done on-site. As detailed in the attached plan, the water and soil vapors, after being pumped from the wells, will be treated in the on-site treatment plant before release to the city sanitary sewer system to be treated in their water treatment plant. The biological treatment of the water takes place in bio-reactors. The bio-reactors are essentially tanks of appropriate capacity containing a substrate on which the organisms can grow. The substrate in the tanks are either a synthetic mat or activated carbon. The substrate provides the largest possible surface area for the bacteria to adhere to and grow. The maximum available substrate maximizes the population of bacteria available for treating the water which increases the quantity and rate of water that can be treated.

2. **Bioremediation Agent Proposed for Use**

Name: BIOGEE HC (see attached bulletin).

Type of Agent (nutrient or microbe):

The agent is a microbe, but, nutrients are added.

Is agent on the NCP Product Schedule? **Yes** **X** **No**

The agent BIOGEE HC is listed on the Product Schedule under Bulletin B-35. (See attached bulletin).

To What Tier-Level Has It Been Evaluated?

Tier I Tier II

Tier III **Tier IV X**

As mentioned there was a preliminary test of the microbes effectiveness on an underground tank containing contaminated water and free product. The microbes cleaned the water in one month or less (see attached report). Also, during Questar's interim operations the microbes were used in the treatment plant effectively. And, as detailed in the attached Bioremediation Plan, a formal limited field-scale demonstration of the bioremediation agent has been conducted. The microbe was found to be effective. The results of the field trial monitoring, analysis, and evaluation are also presented in the plan.

Source of Bioremediation Agent

Richards Laboratories Inc., 55 East Center, Pleasant Grove, Utah, 84062

Estimated Amount Needed

A quantity is not critical. The Bio-reactors are inoculated with a specific culture initially and then allowed to grow to their maximum population on the substrate.

Amount Available

There is an adequate supply available.

3. **Have you verified that the agent is able to degrade the substance spilled?** **Yes X** No

Refer to the attached plan for a detailed analysis of the field trial.

4. **Equipment To Be Used for Applying Bioremediation Agent.**

Type(backpack spray, sprinkler, etc.)

There is no equipment used to apply this agent. As explained in the attached plan the agent is allowed to grow on a medium or substrate in a tank. The substrate provides a large surface area on which the organisms can grow. The organisms perform their

function breaking down the contamination while growing on the substrate in the bio-reactor tanks.

Available from: **Name: NA**

Address:

Telephone:

Name of Equipment (if known): NA

Time (in hours) needed for transport to the spill site, after preparation: NA

5. **Has Equipment Been Calibrated for Use With Bioremediation Agents?**

All piping and tankage in the water treatment system has been engineered to treat the largest flow capacity expected to the required efficiency.

6. **Planned Rate of Application: NA**

How frequently will agent by applied? NA

7. **Does a Bioremediation Application/Operation Plan Exist?**

Yes, the bioremediation plan is attached.

8. **Does a Monitoring Plan Exist?** Yes

If So, Who Developed It?

It was developed by EPA, the U.S. Army Corp of Engineers (USACE), and their contractor International Technologies (IT).

9. **Do special precautions need to be taken to prevent improper handling or application of the agent?**

Yes.

If So, What Are They?

The use of protective gloves and chemical goggles is recommended when using the product.